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ABSTRACT

This report describes an Indiana project to develop occupational matrices in six vocational service areas--agribusiness, business and office, health, home economics, marketing and distribution, and trades and industries. (These matrices cluster industry-verified job titles in an occupational field on the basis of task commonality.) These procedures for achieving the objective are discussed: (1) identify occupational area for study; (2) appoint working committee; (3) identify program, curricula, course dimensions of matrix; (4) identify survey population and select sample; (5) construct and field test survey instrument; (6) distribute surveys; (7) analyze data; (8) critique and review data; and (9) distribute matrix. Charts present survey data from these companies/businesses: agriculture sales and service, printing, welding, and building trades. Appendixes, amounting to over one-half of the report, include six job title survey instruments and program matrices for agriculture sales and service, printing, welding, and building trades. Each program matrix assigns each job title to a course category that is part of a designated curriculum. Tasks, course core, curricula core, and program core are also specified. (YLB)

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FINAL REPORT

October 1979 - September 31, 1980

"Development of Occupational Matrices"

Principal Investigator:

Dr. B. R. West
Project Director

Project #7-80-III-3

Indiana University-Purdue University
at Indianapolis
Indianapolis, Indiana

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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September 30, 1980

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Project population

Groups	Numbers of persons: Impacted by project	Conducting or giving input
students		
secondary	116,100	- 0 -
postsecondary	13,000	- 0 -
adult	45,300	- 0 -
school personnel		
secondary	700	- 0 -
postsecondary	300	- 0 -
adult	900	- 0 -
other		
teacher educators	60	12
employers	200	42
employees	140	42
other:_____	30	- 0 -
special needs		
disadvantaged	8,500	- 0 -
handicapped	3,100	- 0 -
migrant	2,225	- 0 -
minority	16,920	- 0 -
limited English proficiency		
other:_____		

III. STATEMENT OF OBJECTIVES

Objectives of the Project

The objective of this project was to develop occupational matrices in six vocational service areas. The specific need was to be identified by the State Board of Vocational and Technical Education.

IV. STATEMENT OF THE PROBLEM

There is a growing pressure on the vocational educator to document in specifics, as opposed to generalities, what a student can do as a result of a training program. To communicate the "doing" to the lay public, it must be couched in an everyday, real-life context rather than statements about hours of training, academic or vocational skills attained, or courses taken. The taxpayer and the tuition-paying individual, wanting recognizable and convincing proof that the educational dollar is well spent, are asking for concrete evidence that persons being graduated from programs can function in a career role. What better proof of a vocational program's efficacy than to be able to say that Graduate A is capable of functioning in job title X rather than possessing "entry level skills" in a broad employment area. The hard evidence supporting this claim is that the potential employee can perform the tasks comprising the job title to a standard referenced in business and industry.

Before attempting to develop a curriculum and implement a vocational program that will yield this kind of hard evidence of performance, the State Board of Vocational and Technical Education thought it necessary to identify the training target. The target which the State Board of Vocational and Technical Education has set for Indiana is the preparation of each individual for a single job title or a cluster of related job titles using programs and curricula which are based on industry-verified job titles and tasks. The first step in the job title-task verification process is the clustering of job titles in an occupational field on the basis of task commonality. The research terminates in a

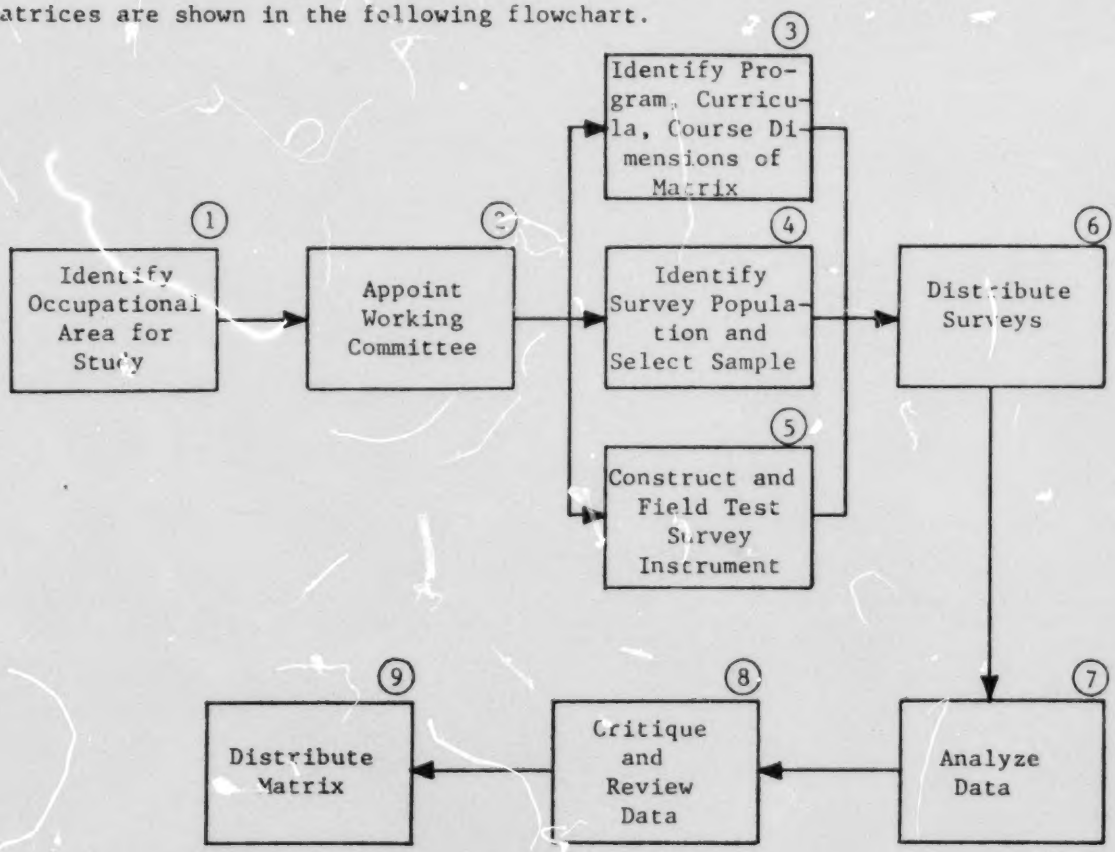
process model to be used by decision makers to administratively structure vocational programs and to identify the tasks corresponding to the job titles. The model is called an occupational matrix.

Since the matrix is the essential first step in the structuring of performance based vocational education (PBVE) programs, there existed a need for a matrix for each existing program area and a need for investigation into areas of the world of work where current vocational programs do not exist. The purpose of this proposal was, therefore, to develop matrices in the vocational program areas of agri-business, business and office, health, home economics, marketing and distribution, and trades and industry; and to investigate occupational areas not served by current vocational programs.

V. STRATEGIES

Procedure

The developmental steps which were followed to structure the occupational matrices are shown in the following flowchart.



Block 1. A vocational program corresponding to an occupational employment area was identified for study by the State Board of Vocational and Technical Education and relayed to the project director.

Block 2. A working committee comprised of local teachers, secondary and postsecondary, and State level administrators in the vocational discipline under investigation was convened. Their purpose was to (a) define or redefine the occupational area, (b) establish tentative parameters of the study, and (c) to identify candidates for an advisory committee who assisted in the preliminary analysis of the occupational cluster and who critiqued, reviewed, and interpreted the results of the survey. A list of the working committee members for each matrix is shown on pages 9-12.

Blocks 4, 5 & 6. The working committee met until the following was accomplished:

1. The first three (sometimes four) dimensions of a matrix were hypothesized. These dimensions consisted of (1) the occupational cluster subdivided into programs, (2) the programs subdivided into curricula or courses, (3) the curricula, where necessary, subdivided into courses, and (4) the courses identified by a representative listing of job titles. The criteria used to taxonomize the job titles provided for: (1) administrative flexibility and feasibility, (2) open-endedness to add new or emerging occupations, (3) large common task and learning content cores, and (4) assignment of job titles to mutually exclusive groupings. Figure 1 on the following page depicts the taxonomizing framework.

2. A survey population was identified, stratified and a sample selected. The population was stratified in a manner to yield the greatest number of job titles in an occupational cluster.

3. A survey instrument was constructed to gather job title data. The questionnaire was designed to (1) permit easy response in terms of respondent time and effort and (2) gather unbiased data. The questionnaire essentially

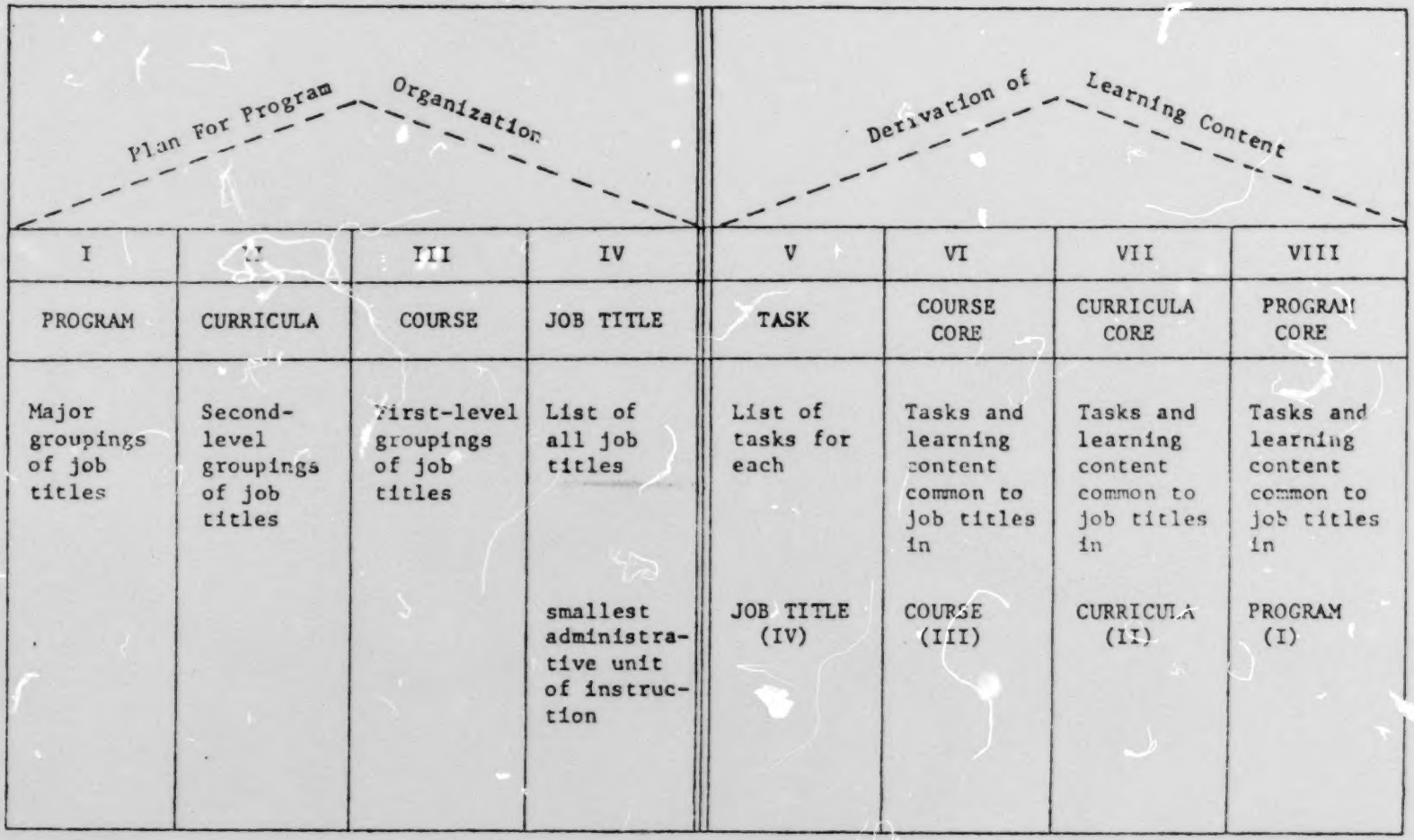

Plan For Program Organization
Derivation of Learning Content
I
II
III
IV
V
VI
VII
VIII
PROGRAM
CURRICULA
COURSE
JOB TITLE
TASK
COURSE CORE
CURRICULA CORE
PROGRAM CORE
Major groupings of job titles
Second-level groupings of job titles
First-level groupings of job titles
List of all job titles
smallest administrative unit of instruction
List of tasks for each
JOB TITLE (IV)
Tasks and learning content common to job titles in
COURSE (III)
Tasks and learning content common to job titles in
CURRICULA (II)
Tasks and learning content common to job titles in
PROGRAM (I)

Figure 1

asked the respondent to list the job titles of the workers and to categorize them according to the hypothesized matrix dimensions. Only a few job titles were provided as examples to avoid forcing the respondent to "fit" the company's job titles into ours. Care was taken to allow the respondent to categorize job titles outside the limits of the proposed matrix. The instrument was locally field tested before mailing. Sample instruments are shown in Appendix A.

Blocks 6 & 7. The surveys were distributed to the sample and the responses analyzed. The results of the findings either substantiated the hypothesized matrix or provided the information necessary to correct the job title taxonomy to conform to the real world.

Block 8. The matrix resulting from the survey data was presented to the advisory committee and adjustments that needed to be made because of faulty data analysis were made.

Block 9. The matrix was distributed to the State Board of Vocational and Technical Education and the Indiana Curriculum Materials Center for dissemination.

VI.-VII. ANALYSIS & FINDINGS

Descriptions of the Populations and Responses

The populations from which each of the occupational matrix survey samples were drawn are shown in Figures 2-5. The Population column shows the population stratification. It describes the kinds of companies or businesses that the advisory committee thought represented the particular occupational universe. The committee felt that each occupational stratification would yield the greatest diversity of job titles.

The Sample Size and Population Percentage Sent columns identify the proportion of the population represented by each stratum. The proportion was determined, where possible, by actual count of companies in each stratum in Indiana. The company data and addresses were found in the (1) Indiana Industrial Directory and (2) Dun and Bradstreet's Million Dollar Directory. For the Building Trades matrix it was determined from a printout of Indiana builders and contractors secured from the Indiana Homebuilders Association. The total of the Sample Size column indicates the total number of surveys sent.

The response side of each Figure shows the Total Response, Response Rate and Population Percentage Returned. The Total Response column shows the number of returns from each sample stratum. The Response Rate column gives the rate of return for each st atum. The Population Percentage Returned shows the ratio of returns between each sample strata and its proportion in the population. By comparing the Population Percentage Sent column with the Population Percentage Returned column, the degree of return bias can be be ascertained.

Figure 2

AG. SALES AND SERVICE

Survey Data:

POPULATION DESCRIPTION			RESPONSE		
Population	Sample Sent	Population % Sent	Total Response[1]	Response Rate %	Population % Returned
Chemicals/Fertilizer	344	53.1	77	22.4	56.2
Crop Storage/Handling Equipment	8	1.2	3	37.5	2.1
Feeds	80	12.3	16	20.0	11.6
Elevators	65	10.0	10	15.4	7.3
Certified Seed Producers	70	10.8	12	17.1	8.7
Farm Supplies	62	10.0	12	19.4	8.7
Livestock Handling Equipment/Supplies	18	2.7	7	38.9	5.1
TOTALS	647	100.1	137	21.2	99.7

Advisory Committee:

Name	Position
C. Edward Brown	Administrator, State Level
Royce Costin	Agri-Business Instructor, Seconday
Donald J. Haberlin	Agri-Business Instructor, Secondary
Michael Mauer	Agri-Business Instructor, Secondary
Timothy J. McNealy	Agri-Business Instructor, Secondary

Status: September 30, 1980

[1]This figure represents the total number of companies responding, all of which are not necessarily usable.

Figure 3

PRINTING

Survey Data:

POPULATION DESCRIPTION			RESPONSE		
Population	Sample Sent	Population % Sent	Total Response[1]	Response Rate %	Population % Returned
Newspapers	12	4.3	5	41.7	6.6
Business Forms	6	2.1	0	--	--
Typesetting	6	2.1	0	--	--
Books/Periodicals	14	5.0	2	14.3	2.6
Utilities	15	5.4	9	60.0	12.0
Commercial Printers	219	79.6	59	26.9	78.6
Gravure	3	1.0	0	--	--
TOTALS	275	99.5	75	27.3	99.8

Advisory Committee:

Name	Position
Richard All	Instructor, Post-secondary
Gary Bell	Industry Representative
Ed Essex	Instructor, Secondary
Jay Straka	Industry Representative
Ken Whitkanack	Instructor, Post-secondary

Status: Complete

[1]This figure represents the total number of companies responding, all of which are not necessarily usable.

Figure 4

WELDING

Survey Data:

POPULATION DESCRIPTION			RESPONSE		
Population	Sample Sent	Population % Sent	Total Response[1]	Response Rate %	Population % Returned
Truck, Farm & Industrial	7	1.9	2	28.6	1.9
Pipelines	3	.1	1	33.3	.1
Mining, Ship Building, & Railroads	3	.1	1	33.3	.1
Industrial General, Bridges & Tunnels	20	5.4	4	20.0	3.8
Sheet Metal, Metal & Steel	236	63.8	66	28.0	62.9
Orthopedic, Musical Instruments	3	.1	1	33.3	.1
Architectural & Household	3	.1	2	66.7	1.9
Air Conditioning, Welding & Electronic	3	.1	1	33.3	.1
Aluminum, Magnesium	3	.1	0	--	--
Forging, Steel & Iron	36	9.7	11	30.6	10.5
Utilities, Steel Mills	23	6.2	8	34.8	7.6
Job Shops, Small Manufacturers	30	8.1	8	26.7	7.6
TOTALS	370	95.7	105	28.4	96.6

Advisory Committee:

Name	Position
Nick Bratkovich	Industry Representative
Huey Calvain	Instructor, Post-secondary
Jan Conway	Instructor, Secondary
Harry Prah	Industry Representative
Dan Sterrett	Instructor, Secondary
Harold Wortman	Instructor, Post-secondary

Status: Complete

[1]This figure represents the total number of companies responding, all of which are not necessarily usable.

Figure 5

BUILDING TRADES

Survey Data:

POPULATION DESCRIPTION		RESPONSE	
Population	Sample Size*	Total Response [1]	Response Rate
Home Builders & Construction Companies	312	106	33.97%

*The mailing list was provided by the Indiana Home Builders Association and was not stratified.

Advisory Committee:

Name	Position
F. Lee Bushong	Teacher Trainer, Post-secondary
Walter Curran	Instructor, Secondary
Edgar Fleenor	Teacher Trainer, Post-secondary
Fred Hagadorn	Plumbers & Steamfitters Union Representative
Jerry Keiser	Human Resources Coordinator
Bruce Stauffer	Building Assn. of Greater Indianapolis Representative
Bob Thomas	Dept. of Public Instruction Representative
Wendell Vandivier	Carpenters Joint Apprenticeship Council Representative
Robert Weiss	Indiana Home Builders Assn. Representative

Status: Complete

[1]This figure represents the total number of companies responding, all of which are not necessarily usable.

Two other matrices, Agricultural Construction and Architectural Drafting were unfinished as of September 30, 1980. An initial mailing has been made and a second planned.

Treatment of the Data

The survey data were recorded by the respondents on the survey forms shown in Appendix A. To explain the treatment of the data, the following instruction page (page 2) for the Welding survey form will be used.

Each respondent was asked to provide three bits of information about each different job title in the area under study.

1. List each job title for the area of concern.
2. List the number of employees in each job title.
3. Distribute the job title holders' time across the various work categories.

The Instruction page tells how this was done.

The job titles reported on the survey form next had to be assigned to a course category on the matrix. The job title was assigned to the course category in which the greatest number of respondents assigned the greatest percentage of time. In the example, pipe welders and maintenance welders were assigned to the Electric Welding, SMAW category and the production welder to the Electric Welding, GMAW category.

The data for each occupational area was treated in this manner. The resulting matrices are shown in Appendix B.

INSTRUCTIONS

A. Examine the sample survey form below and note the column headings. They are:

Column 1: Job Titles. List the job titles assigned to persons involved with welding, metal separation, and cutting.

Column 2: Number of Workers. List the number of workers that are involved in the above job titles.

Columns 3-17: These columns differentiate the metal preparation, joining, and separating processes that are a part of the worker's job. Indicate the percent of time worked in each process.

Columns 18-20: These columns are for areas of welding related activities not specified. Please use them freely.

B. Look at the example given below. The sample welding organization employs:

** 3 Pipe Welders. This is their job title. They spend 50% of their working time in the S.M.A.W. (Stick) electrode welding process, 10% of their time in G.T.A.W. (T.I.G., Heli-arc), 30% in G.M.A.W. (M.I.G., Wirefeed, Fluxcore), and 10% in Oxyfuel Welding (Gas).

** 4 Maintenance Welders. These workers spend 40% of their time working in S.M.A.W. (Stick) electrode welding process, 10% in G.T.A.W. (T.I.G., Heli-arc), 10% in G.M.A.W. (M.I.G., Wirefeed, Fluxcore), 10% in Oxyfuel Welding (Gas), 20% in Oxyfuel Brazing, 5% in Oxyfuel, and 5% in Mechanical Cutting.

** 40 Production Welders. These workers spend 25% of their working time in the S.M.A.W. (Stick) electrode welding process, 15% of their time in G.T.A.W. (T.I.G., Heli-arc), 50% in G.M.A.W. (M.I.G., Wirefeed, Fluxcore), and 10% in Electric Air Carbon Arc.

C. On the survey form on page three, list the job titles of your workers and classify them by indicating the percentage of working time they spend in each of the appropriate Columns 3-17--Electric Welding, Oxyfuel, Metal Separation, and Metal Preparation. If additional welding related activities are performed that we have not included, please write them in the blank space after "Other" in Columns 18-20.

D. Total Column 2. The total of this column should equal the Total Employees in Block II on the first page.

E. Place the completed questionnaire in the enclosed, stamped, and addressed envelope and mail it. Thank you.

WELDING PROCESSES

EXAMPLE:		Electric Welding					Oxyfuel		Metal Separation				Metal Preparation				Other--Specify		
Column (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
JOB TITLE	Number of Workers	S.M.A.W. (Stick)	G.T.A.W. (T.I.G. Heli-arc)	G.M.A.W. (M.I.G. Wirefeed, Fluxcore)	S.A.W. (Sub. Arc)	R.W. (Resistance Welding)	Oxyfuel Welding (Gas)	Oxyfuel Brazing	Plasma	Oxyfuel	Electric Air Carbon Arc	Mechanical Cutting	Plasma	Oxyfuel	Electric Air Carbon Arc	Mechanical Cutting	(Other)	(Other)	(Other)
PIPE WELDER	3	50%	10%	30%			10%												
MAINTENANCE WELDER	4	40%	10%	10%			10%	20%		5%		5%							
PRODUCTION WELDER	40	25%	15%	50%										10%					

VIII. EVALUATION

The ultimate evaluation of this project will come after a task survey is made for each job title on each matrix. However, it is believed that the matrices are valid for two reasons:

1. the advisory committees were composed of people from education and industry who were well acquainted with their respective occupational areas.

2. the responses from the field were valid and closely represent the relationship that exists among job titles in their respective occupational areas.

FINAL REPORT ABSTRACT

A. The PROCESS/PRODUCT(S) to be adopted/adapted and delivered by this project were:

1. A job title matrix for each occupational area identified for study.
2. A publication of Indiana's occupational universe.

B. The specific OBJECTIVE of the proposal was to:

Develop occuaptional matrices in six vocational services areas as identified by the State Board of Vocational and Technical Education and the project director.

C. The PROCEDURES for achieving this objective were:

1. Identify occupational area for study
2. Appoint working committee
3. Identify program, curricula, course dimensions of matrix
4. Identify survey population and select sample
5. Construct and field test survey instrument
6. Distribute surveys
7. Analyze data
8. Critique and review data
9. Distribute matrix

D. The expected OUTCOMES for or potential IMPACTS on vocational education were:

The matrices developed will provide a process model which can be used by decision makers to administratively structure PBVE programs and to identify the tasks corresponding to the job titles.

APPENDIX A

Job Title Survey Instruments

Ed Brown
274 surveys
(population)

INDIANA
V-TECS

E & T Bldg., Room 1107 799 W. Michigan St. Indianapolis, Indiana 46202 Phone (317) 264-2277

TO: OWNER/MANAGER

In order to improve the training of your future workers, we in education are concerned with matching the student's skills with those required by your employees. Since these are life-time jobs for the trainees, we believe they should be described and patterned by you, the employer.

Indiana, along with 17 other states, have organized together and are working on this problem. This organization is called the Vocational-Technical Education Consortium of States or V'TECS. Their dual purpose is to obtain first-hand information from the employer so that specific work skills can be duplicated in training programs which will provide a future work force trained to meet your needs.

Indiana is currently studying the Agri-Business field which includes Agricultural Sales and Service. We need your help to do two things:

1. Identify the kinds of jobs, by job title, that actually exist in the real world of Ag. Sales and Service; and
2. Identify the tasks (skills) that these job title holders perform.

There is a shortage of well-trained workers in the Agri-Business field. You are concerned with the problem, and so is education. The solution, therefore, calls for the joint efforts of industry and education. This survey offers you the opportunity for input into the training programs designed to prepare students for those jobs that actually exist.

This questionnaire is designed to gather the data specified in Item 1--to identify job titles existing in the Ag. Sales and Service area. Your response is crucial because you are the only source for this information. It is not found in a textbook.

Before you lay this letter aside, please complete the survey sheets attached and return them in the enclosed, stamped, and addressed envelope.

Very truly yours,

Dr. B. R. West, Project Director
Indiana V'TECS Coordinator

slw
Enclosures

SURVEY TO DETERMINE JOB TITLES
IN AGRICULTURAL SALES AND SERVICE

I. Indicate the type of activity your company is involved in (check those that are appropriate).

☐ Production Supplies

_____ Livestock Handling Equipment

_____ Crop Storage and Handling Equipment

_____ Fertilizer/Chemicals

_____ Seed

_____ Feed

_____ Other (specify)_____

_____

_____

☐ Product Marketing

_____ Crops

_____ Livestock

_____ Other (specify)_____

_____

_____

☐ Other (specify):_____

_____

_____

II. Write the total number of workers employed by your company that are involved in Ag. Sales and Service.

* ☐ TOTAL EMPLOYEES

*This figure should equal the number of total employees in Column 2 on page 3.

INSTRUCTIONS

A. Examine the sample survey form below and note the Column headings. They are:

Column 1: Job Titles. List the job titles assigned to persons involved with Ag. Sales and Service.

Column 2: Number of Employees. List the number of employees that are involved in the above job titles.

Columns 3-13: These columns identify the area of responsibility in which each job title may be classified. Indicate the percent of time worked in each area.

Columns 14-17: These columns are for areas of responsibility which we have not included. Please use them freely.

B. Look at the example given below. This sample Ag. Sales and Service firm employs:

** 2 Chemical Applicators. This is their job title. They spend 100% of their working time in the Fertiler/Chemicals area.

** 1 Livestock Yard Worker. This worker spends 10% of his working time in Livestock Handling Equipment, 20% in Feed, and 70% in Livestock.

** 2 Feed Mill Workers. These workers spend 20% of their time in Crop Storage, 10% in Seed, 60% in Feed, and 10% in Crops.

** 1 Seed Salesman. This worker spends 100% of his time in the Seed area.

C. On the survey form on page three, list the job titles of your workers and classify them by indicating the percentage of their working time they spend in each of the areas of Production Supplies and Product Marketing (Columns 3-13). If additional Ag. Sales and Service activities are performed, that we have not included, please write them in the blank spaces below "Other" in Columns 14-17.

D. Total Column 2. The total of this column should equal the Total Employees in Block II on the first page.

E. Place the completed questionnaire in the enclosed, stamped, and addressed envelope and mail it. Thank you.

E X A M P L E:

Column (1)	(2)	PRODUCTION SUPPLIES (3)	(4)	(5)	(6)	(7)	(8)	(9)	PRODUCT MARKETING (10)	(11)	(12)	(13)	OTHER (Specify) (14)	(15)	(16)	(17)
JOB TITLE	Number of Employees	Livestock Handling Equipment	Crop Storage and Handling Equipment	Fertilizer/ Chemicals	Seed	Feed	Other (Specify)	Other (Specify)	Crops	Livestock	Other (Specify)	Other (Specify)	(Specify)	(Specify)	(Specify)	(Specify)
CHEMICAL APPLICATOR	2			100%												
LIVESTOCK YARD WORKER	1	10%				20%				70%						
FEED MILL WORKER	2		20%		10%	60%			10%							
SEED SALESMAN	1				100%											

Column (1)	(2)	PRODUCTION SUPPLIES (3)	(4)	(5)	(6)	(7)	(8)	(9)	PRODUCT MARKETING (10)	(11)	(12)	(13)	OTHER (Specify) (14)	(15)	(16)	(17)
JOB TITLE	Number of Employees	Livestock Handling Equipment	Crop Storage and Handling Equipment	Fertilizer/ Chemicals	Seed	Feed	Other (Specify)	Other (Specify)	Crops	Livestock	Other (Specify)	Other (Specify)	(Specify)	(Specify)	(Specify)	(Specify)
TOTAL EMPLOYEES																

This figure should equal the number of total employees in Block II on page 1.

INDIANA
V-TECS

E & T Bldg., Room 1107 799 W. Michigan St. Indianapolis, Indiana 46202 Phone (317) 264-2277

This project has been endorsed by G.A.T.F.

TO: Personnel Manager/Director of Manufacturing

In order to improve the training of your future workers, we in education are concerned with matching the student's skills with those required by your employees. Since these are life-time jobs for the trainees, we believe they should be described and patterned by you, the employer.

Indiana, along with 17 other states, have organized together and are working on this problem. This organization is called the Vocational-Technical Education Consortium of States or V'TECS. Their dual purpose is to obtain first-hand information from the employer so that specific work skills can be duplicated in training programs which will provide a future work force trained to meet your needs.

Indiana is currently studying the area of Printing with the help of a Printing Advisory Committee, and we need your help to:

> Identify the kinds of jobs, by job title, that actually exist in your plant.

There is a shortage of well-trained workers in the Printing industry. You are concerned with the problem, and so is education. The solution, therefore, calls for the joint efforts of industry and education.

This survey offers you the opportunity for input into the training programs designed to prepare students for those jobs that actually exist.

This questionnaire is designed to identify job titles existing in the Printing industry. Your response is crucial because you are the only source for this information. It is not found in a textbook.

Before you lay this letter aside, please complete the survey sheets attached and return them in the enclosed, stamped, and addressed envelope.

Very truly yours,

B. R. West

Dr. B. R. West, Project Director
Indiana V'TECS Coordinator

Printing Advisory Committee: (1) Richard All, Indiana Vocational Technical College, Terre Haute; (2) Gary Bell, Rutgers Packaging Corp., Indianapolis; (3) Ed Essex, F. J. Reitz High School, Evansville; (4) Jay Straka, Moore-Langen Printing & Publishing Co., Indianapolis; and (5) Ken Whitkanack, Vincennes University, Vincennes.

slw
Enclosures

SURVEY TO DETERMINE JOB TITLES IN THE PRINTING INDUSTRY

I. Indicate the printing processes your company is involved in (check those that are appropriate).

- ☐ Flexography
- ☐ Gravure
- ☐ Letterpress
- ☐ Offset
- ☐ Screen
- ☐ Thermography
- ☐ Xerography
- ☐ Other (please specify):

_____

_____

_____

II. Indicate your company's principal product.

_____

_____

_____

III. Write the total number of workers employed by your company that are involved in printing processes.

☐ TOTAL EMPLOYEES *

*This figure should equal the total employees listed in Column 2 on page 3.

INSTRUCTIONS

A. Examine the sample survey form below and note the Column headings. They are:

Column 1: Job Titles. List the job titles assigned to persons involved with printing processes.

Column 2: Number of Employees. List the number of employees that are involved in the above job titles.

Columns 3-25: These columns differentiate the gravure, offset, and letterpress processes that are a part of the worker's job as well as management responsibilities. Indicate the percent of time worked in each process.

Columns 26-31: These columns are for areas of printing-related activities not specified. Please use them freely.

B. Look at the example given below. This sample printing plant employs:

** 2 Press Operators. This is their job title. They spend 50% of their working time in Offset-Press Operation, and 50% in Letterpress-Press Operation.

** 1 Stripper. This worker spends 40% of his time working in Gravure-Make-up, 30% in Offset-Make-up, and 30% working in the Letterpress-Make-up area.

** 3 Plate Makers. These workers spend 60% of their working time in Offset-Plate Making, and 40% in Offset-Press Operation.

** 1 Estimator. This worker spends 20% of his time in Purchasing, 25% in Sales, and 55% in Scheduling activities.

C. On the survey form on page three, list the job titles of your workers and classify them by indicating the percentage of their working time they spend with each process in each of the appropriate Columns 3-25: Gravure, Offset, Letterpress, and Management/Supervision. If additional printing-related activities are performed, that we have not included, please write them in the blank space below "Other" in Columns 26-31 (such as silk screen, flexography, thermography, etc.).

D. Total Column 2. The total of this column should equal the Total Employees in Block III on the first page.

E. Place the completed questionnaire in the enclosed, stamped, and addressed envelope and mail it. Thank you.

EXAMPLE:

Column ①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰	⑱	⑲	⑳	㉑	㉒	㉓	㉔	㉕	㉖	㉗	㉘	㉙	㉚	㉛
		PRINTING PROCESSES																		MANAGEMENT/ SUPERVISION					OTHER (Please Specify)					
		① GRAVURE						⑨ OFFSET				⑬ LETTERPRESS																		
JOB TITLE	Number of Employees	Layout (Design, Clip Art, etc.)	Composition (Typesetting)	Make-up	Plate Making	Press Operation	Finish (Binders)	Layout (Design, Clip Art, etc.)	Composition (Typesetting)	Make-up	Plate Making	Press Operation	Finish (Binders)	Layout (Design, Clip Art, etc.)	Composition (Typesetting)	Make-up	Plate Making	Press Operation	Finish (Binders)	Purchasing	Sales	Scheduling	Supervision	Quality Control	Layout (Design, Clip Art, Etc.)	Composition (Typesetting)	Make-up	Plate Making	Press Operation	Finish (Binders)
PRESS OPERATOR	2										50%							50%												
STRIPPER	1			40%						30%						30%														
PLATE MAKER	3										60%	40%																		
ESTIMATOR	1																			20%	25%	55%								

PRINTING PROCESSES

Column (1)		(1) GRAVURE						(9) OFFSET						(15) LETTERPRESS						MANAGEMENT/ SUPERVISION					OTHER (Please Specify) (26)					
JOB TITLE	(2) Number of Employees	Layout (Design, Clip Art, etc.)	Composition (Typesetting)	Make-up	Plate Making	Press Operation	Finish (Bindery)	Layout (Design, Clip Art, etc.)	Composition (Typesetting)	Make-up	Plate Making	Press Operation	Finish (Bindery)	Layout (Design, Clip Art, etc.)	Composition (Typesetting)	Make-up	Plate Making	Press Operation	Finish (Bindery)	Purchasing	Sales	Scheduling	Supervision	Quality Control	Layout (Design, Clip Art, Etc.)	Composition (Typesetting)	Make-up	Plate Making	Press Operation	Finish (Bindery)
TOTAL EMPLOYEES	*																													

*This figure should equal the Total Employees listed in Block IV on page 1.

INDIANA
V-TECS

This project has been approved by A.W.S., Indiana section.

AWS

TO: Personnel Director or Works Manager

In order to improve the training of your future workers, we in education are concerned with matching the student's skills with those required by your employees. Since these are life-time jobs for the trainees, we believe they should be described and patterned by you, the employer.

Indiana, along with 17 other states, have organized together and are working on this problem. This organization is called the Vocational-Technical Education Consortium of States or V'TECS. Their dual purpose is to obtain first-hand information from the employer so that specific work skills can be duplicated in training programs which will provide a future work force trained to meet your needs.

Indiana is currently studying the area of Welding with the help of a Welding Advisory Committee, some of whom are members of the American Welding Society. We need your help to do two things:

1. Identify the kinds of jobs, by job title, that actually exist in the Welding industry; and
2. Identify the tasks (skills) that these job title holders perform.

There is a shortage of well-trained workers in the Welding industry. You are concerned with the problem, and so is education. The solution, therefore calls for the joint efforts of industry and education.

This survey offers you the opportunity for input into the training programs designed to prepare students for those jobs that actually exist.

This questionnaire is designed to gather the data specified in Item 1--to identify job titles existing in the Welding industry. Your response is crucial because you are the only source for this information. It is not found in a textbook.

Before you lay this letter aside, please complete the survey sheets attached and return them in the enclosed, stamped, and addressed envelope.

Very truly yours,

B. West

Harry F Prah

Dr. B. R. West, Project Director
Indiana V'TECS Coordinator

Harry F. Prah, Director
District 14

Welding Advisory Committee: Nick Bratkovich, Huey Calvain, Jan Conway, Harry Prah, Larry Price, Dan Sterrett, and Harold Wortman

slw
Enclosures

SURVEY TO DETERMINE JOB TITLES IN THE WELDING INDUSTRY

I. Indicate the type of activity your company is involved in (check those that are appropriate.

☐ Manufacturer

a. Please specify the items manufactured: _____

_____

_____

b. Please specify the type of material used (aluminum, steel, copper, etc.): _____

_____

☐ Fabricator

a. Please specify: _____

_____

☐ Job Shop

a. Please specify (repair, service, etc.): _____

_____

☐ Maintenance

a. Please specify: _____

_____

☐ Other: _____

_____

II. Write the total number of workers employed by your company that are involved with welding, metal separation, and cutting.

☐ TOTAL EMPLOYEES*

*This figure should equal the number of Total Employees in Column 2 on page 3.

INSTRUCTIONS

A. Examine the sample survey form below and note the Column headings. They are:

Column 1: Job Titles. List the job titles assigned to persons involved with welding, metal separation, and cutting.

Column 2: Number of Workers. List the number of workers that are involved in the above job titles.

Columns 3-17: These columns differentiate the metal preparation, joining, and separating processes that are a part of the worker's job. Indicate the percent of time worked in each process.

Columns 18-20: These columns are for areas of welding related activities not specified. Please use them freely.

B. Look at the example given below. The sample welding organization employs:

** 3 Pipe Welders. This is their job title. They spend 50% of their working time in the S.M.A.W. (Stick) electrode welding process, 10% of their time in G.T.A.W. (T.I.G., Heli-arc), 30% in G.M.A.W. (M.I.G., Wirefeed, Fluxcore), and 10% in Oxyfuel Welding (Gas).

** 4 Maintenance Welders. These workers spend 40% of their time working in S.M.A.W. (Stick) electrode welding process, 10% in G.T.A.W. (T.I.G., Heli-arc), 10% in G.M.A.W. (M.I.G., Wirefeed, Fluxcore), 10% in Oxyfuel Welding (Gas), 20% in Oxyfuel Brazing, 5% in Oxyfuel, and 5% in Mechanical Cutting.

** 40 Production Welders. These workers spend 25% of their working time in the S.M.A.W. (Stick) electrode welding process, 15% of their time in G.T.A.W. (T.I.G., Heli-arc), 50% in G.M.A.W. (M.I.G., Wirefeed, Fluxcore), and 10% in Electric Air Carbon Arc.

C. On the survey form on page three, list the job titles of your workers and classify them by indicating the percentage of working time they spend in each of the appropriate Columns 3-17--Electric Welding, Oxyfuel, Metal Separation, and Metal Preparation. If additional welding related activities are performed that we have not included, please write them in the blank space after "Other" in Columns 18-20.

D. Total Column 2. The total of this column should equal the Total Employees in Block II on the first page.

E. Place the completed questionnaire in the enclosed, stamped, and addressed envelope and mail it. Thank you.

EXAMPLE:

Column ①	②	WELDING PROCESSES: Electric Welding					Oxyfuel		Metal Separation				Metal Preparation				Other--Specify		
JOB TITLE	Number of Workers	③ S.M.A.W. (Stick)	④ G.T.A.W. (T.I.G. Heli-arc)	⑤ G.M.A.W. (M.I.G. Wirefeed, Fluxcore)	⑥ S.A.W. (Sub. Arc)	⑦ R.W. (Resistance Welding)	⑧ Oxyfuel Welding (Gas)	⑨ Oxyfuel Brazing	⑩ Plasma	⑪ Oxyfuel	⑫ Electric Air Carbon Arc	⑬ Mechanical Cutting	⑭ Plasma	⑮ Oxyfuel	⑯ Electric Air Carbon Arc	⑰ Mechanical Cutting	⑱ (Other)	⑲ (Other)	⑳ (Other)
PIPE WELDER	3	50%	10%	30%			10%												
MAINTENANCE WELDER	4	40%	10%	10%			10%	20%		5%		5%							
PRODUCTION WELDER	40	25%	15%	50%										10%					

WELDING PROCESSES

Column (1) / JOB TITLE	(2) Number of Workers	Electric Welding					Oxyfuel		Metal Separation				Metal Preparation				Other--Specify		
		(3) S.M.A.W. (Stick)	(4) G.T.A.W.(T.I.G. Heli-arc)	(5) G.M.A.W. (M.I.G. Wirefeed, Fluxcore)	(6) S.A.W. (Sub. Arc)	(7) R.W. (Resistance Welding)	(8) Oxyfuel Welding (Gas)	(9) Oxyfuel Brazing	(10) Plasma	(11) Oxyfuel	(12) Electric Air Carbon Arc	(13) Mechanical Cutting	(14) Plasma	(15) Oxyfuel	(16) Electric Air Carbon Arc	(17) Mechanical Cutting	(18) (Other)	(19) (Other)	(20) (Other)
TOTAL EMPLOYEES	*																		

* This figure should equal the number of Total Employees in Block II on page 1.

Harrison Building
143 West Market Street
Indianapolis, Indiana 46204
(317) 634-0314

TO: HBAI Member

This letter will introduce you to who we are, what we are doing and why your response is so important.

WHO WE ARE AND WHAT WE ARE DOING

The Home Builders Association of Indiana has joined with the State Board of Vocational and Technical Education of Indiana in an effort to research the training needs of the Home Building industry. We need your help to do two things:

1. Identify the kinds of jobs, by job title that actually exist in the Home Building industry, and

2. Identify the tasks (skills) that these job title holders perform.

WHY YOUR RESPONSE IS SO IMPORTANT

There is a shortage of well-trained workers in the Building industry. You are concerned with the problem, and so is education. The solution, therefore, calls for the joint efforts of industry and education.

This survey offers you the opportunity for input into the training programs designed to prepare students for those jobs that actually exist.

This questionnaire is designed to gather the data specified in Item 1--to identify job titles existing in the Home Building industry. Your response is crucial because you are the only source for this information. It is not found in a textbook.

Before you lay this letter aside, please complete the survey sheet attached and return it in the enclosed, stamped, and addressed envelope.

Very truly yours,

Dr. B. R. West
Indiana V'TECS Coordinator

Bob Weiss/slw

Robert M. Weiss
Associate Director
Home Builders Association of Indiana

BRW/RMW:slw

SURVEY TO DETERMINE JOB TITLES IN THE
RESIDENTIAL BUILDING INDUSTRY

I. Write your Name: _____

Company Name: _____

Address: _____

_____

Phone: _____

HBAI Local Name: _____

II. Describe your company (check those appropriate).

- ☐ New Home Builder
- ☐ Remodler
- ☐ Light Commercial Builder
- ☐ Other (Specify) _____

_____

III. Number of units built or remodled per year.

Remodled		New
☐	0 - 5	☐
☐	6 - 10	☐
☐	11 - 20	☐
☐	21 - 50	☐
☐	51 - over	☐

IV. Write the total number of persons employed by you in the box.

☐ Total Employees

INSTRUCTIONS

A. Examine the sample form on the following page and note the Column headings. They are:

Column 1: Job Titles. List job titles assigned to the workers in your organization.

Column 2: Number of Employees. List the number of workers in your organization who have a given job title.

Columns 3-31: These columns identify the area of responsibility in which each job title may be classified and the percentage of time the incumbent spends doing tasks in each area.

Columns 32-33: These columns are for areas of responsibility which we have not included. Please use them freely.

B. Look at the example given on the following page. The sample building trades organization employs:

* 4 Form Builders. This is their job title. They spend 90% of their working time in the Rough Carpentry Foundations category and 10% in Framing tasks.

* 3 Floor Installers. These workers spend 100% of their time in the Finish Carpentry category doing Interior Finishing tasks.

* 2 Bricklayers. These incumbents spend 80% of their time laying brick, 10% laying stone, and 10% laying cement block.

* 1 Paperhanger. This person spends 75% of their time in the Wall Finish category doing Papering tasks and 25% of their time performing Painting tasks.

* 5 Siders. These job title holders spend 100% of their time in the Rough Carpentry category doing Framing and Exterior Trim tasks.

C. On the survey form on page four, list the job titles of all your employees and classify them by indicating the percentage of working time they spend in each of the appropriate Columns 3-33 -- Rough Carpentry, Masonry; Concrete; Finish Carpentry; Insulation; Wall and Ceiling Finishing; Heating, Ventilating and Air Conditioning; Plumbing; Floor Covering; Wall Finish; Ceramic; and Site Preparation. If an additional category is needed, please name the category by writing it in the blank after "Other".

*D. Total Column 2. The total of this column should equal the Total Employees in Block IV on the first page.

E. Place the completed questionnaire in the enclosed, stamped and addressed envelope and mail it.

THANK YOU!

Example

BUILDING TRADES CATEGORIES

Column (1)	(2)	Rough Carpentry			Masonry			Concrete		Finish Carpentry		Insulation			Wall & Ceiling Finishing		Heating, Ventilating & Air Conditioning			Plumbing	Floor Covering			Wall Finish		Ceramic		Site Preparation				
JOB TITLES	Number of Employees	(3) Foundations	(4) Framing and Exterior Trim	(5) Roofing	(6) Brick	(7) Stone	(8) Cement Block	(9) Foundations and Walls	(10) Flatwork	(11) Interior Finishing	(12) Cabinetry	(13) Blown and Batts	(14) Foam	(15) Rigid	(16) Dry Wall	(17) Plaster and Stucco	(18) Air Conditioning	(19) Heating	(20) Ductwork	(21) Plumbing	(22) Carpet	(23) Hardwood	(24) Resilient Tile	(25) Paper	(26) Paint	(27) Wall	(28) Floor	(29) Grading and Excavating	(30) Septic, Water and Sewer	(31) Well	(32) Other:	(33) Other:

BUILDING TRADES CATEGORIES

Column (1)	(2)	Rough Carpentry			Masonry			Concrete		Finish Carpentry		Insulation			Wall & Ceiling Finishing		Heating, Ventilating & Air Conditioning			Plumbing	Floor Covering			Wall Finish		Ceramic		Site Preparation				
JOB TITLES	Number of Employees	(3) Foundations	(4) Framing and Exterior Trim	(5) Roofing	(6) Brick	(7) Stone	(8) Cement Block	(9) Foundations and Walls	(10) Flatwork	(11) Interior Finishing	(12) Cabinetry	(13) Blown and Batts	(14) Foam	(15) Rigid	(16) Dry Wall	(17) Plaster and Stucco	(18) Air Conditioning	(19) Heating	(20) Ductwork	(21) Plumbing	(22) Carpet	(23) Hardwood	(24) Resilient Tile	(25) Paper	(26) Paint	(27) Wall	(28) Floor	(29) Grading and Excavating	(30) Septic, Water and Sewer	(31) Well	(32) Other:	(33) Other:

INDIANA
V'TECS

E & T Bldg., Room 1107 799 W. Michigan St. Indianapolis, Indiana 46202 Phone (317) 264-2277

TO: OWNER/MANAGER

There is a need for well-trained workers in the Agri-Business field. You are concerned with the problem, and so is education. The solution, therefore, calls for the joint efforts of industry and education. This survey offers you the opportunity for input into the training programs designed to prepare students for those jobs that actually exist.

Indiana, along with 17 other states, have organized together and are working on this problem. This organization is called the Vocational-Technical Education Consortium of States or V'TECS. Their dual purpose is to obtain first-hand information from the employer so that specific work skills can be duplicated in training programs which will provide a future work force trained to meet your needs.

Indiana is currently studying the Agri-Business field which includes Agricultural Construction, and we need your help to:

> Identify the kinds of jobs, by job title, that actually exist in the real world of Ag. Construction.

This questionnaire is designed to identify job titles existing in the Ag. Construction area. Your response is crucial because you are the only source for this information. It is not found in a textbook.

Before you lay this letter aside, please complete the survey sheets attached and return them in the enclosed, stamped, and addressed envelope.

Very truly yours,

Dr. B. R. West, Project Director
Indiana V'TECS Coordinator

Mr. C. Edward Brown
Agricultural Education Consultant
Division of Vocational Education

cj

Enclosures

SURVEY TO DETERMINE JOB TITLES IN AGRICULTURAL CONSTRUCTION

I. Indicate the type of activity your company is involved in (check those that are appropriate).

☐ Crop Storage

_____ Erection

_____ Service

_____ Sales

_____ Other (specify)_____

☐ Livestock Facilities

_____ Erection

_____ Service

_____ Sales

_____ Other (specify)_____

☐ Utility Buildings (e.g., machinery, supply storage, repair shop)

_____ Erection

_____ Service

_____ Sales

_____ Other (specify)_____

☐ Other (specify):_____

_____

_____

II. Write the total number of workers employed by your company that are involved in Ag. Construction.

* ☐ TOTAL EMPLOYEES

*This figure should equal the number of total employees in Column 2 on page 3.

INSTRUCTIONS

A. Examine the sample survey form below and note the Column headings. They are:

Column 1: Job Titles. List the job titles assigned to persons involved with Ag. Construction.

Column 2: Number of Employees. List the number of employees that are involved in the above job titles.

Columns 3-14: These columns identify the area of responsibility in which each job title may be classified. Indicate the percent of time worked in each area.

Columns 15-17: These columns are for areas of responsibility which we have not included. Please use them freely.

B. Look at the example given below. This sample Ag. Construction firm employs:

** 1 Service Representative. This is their job title. This worker spends 100% of his working time in the Crop Storage-Service area.

** 1 Excavator. This worker spends 60% of his working time in Crop Storage-Erection, 10% in Livestock Facilities-Erection, and 30% in Utility Buildings-Erection.

** 4 Crew Members. These workers spend 50% of their time in Crop Storage-Erection, 15% in Livestock Facilities-Erection, and 35% in Utility Buildings-Erection.

** 2 Salesmen. These workers spend 55% of their time in Crop Storage-Sales, 5% in Livestock Facilities-Sales, and 40% in Utility Buildings-Sales.

C. On the survey form on page three, list the job titles of your workers and classify them by indicating the percentage of their working time they spend in each of the areas of Crop Storage, Livestock Facilities and Utility Buildings (Columns 3-14). If additional Ag. Construction activities are performed, that we have not included, please write them in the blank spaces below "Other" in Columns 15-17.

D. Total Column 2. The total of this column should equal the Total Employees in Block II on the first page.

E. Place the complete questionnaire in the enclosed, stamped, and addressed envelope and mail it. Thank you.

E X A M P L E

Column	(1)	(2)	Crop Storage (3)	(4)	(5)	(6)	Livestock Facilities (7)	(8)	(9)	(10)	Utility Buildings (11)	(12)	(13)	(14)	Other (Specify) (15)	(16)	(17)
JOB TITLES		Number of Employees	Erection	Service	Sales	Other:	Erection	Service	Sales	Other:	Erection	Service	Sales	Other:			
Service Representative		1		100%													
Excavator		1	60%				10%				30%						
Crew Members		4	50%				15%				35%						
Salesmen		2			55%				5%				40%				

AG.-CONSTRUCTION CATEGORIES

Column (1)	(2)	Crop Storage (3)	(4)	(5)	(6)	Livestock Facilities (7)	(8)	(9)	(10)	Utility Buildings (11)	(12)	(13)	(14)	OTHER (Specify) (15)	(16)	(17)
JOB TITLES	Number of Employees	Erection	Service	Sales	Other:	Erection	Service	Sales	Other:	Erection	Service	Sales	Other:			
AL EMPLOYEES	*															

This figure should equal the number of total employees in Block II on page 1.

INDIANA
V-TECS

E & T Bldg., Room 1107 799 W. Michigan St. Indianapolis, Indiana 46202 Phone (317) 264-2277

TO: Architects/Engineers or Drafting Supervisors

In order to improve the training of your future drafting workers, we in education are concerned with matching the student's skills with those required by your employees. Since these are life-time jobs for the trainees, we believe they should be described and patterned by you, the employer.

Indiana, along with 17 other states, have organized together and are working on this problem. This organization is called the Vocational-Technical Education Consortium of States or V'TECS. Their dual purpose is to obtain first-hand information from the employer so that specific work skills can be duplicated in training programs which will provide a future work force trained to meet your needs.

Indiana is currently exploring the area of Architectural Drafting. We need your help to do two things:

1. Identify the kinds of jobs, by job title, that actually exist in Architectural Drafting, and
2. Identify the tasks (skills) that these job title holders perform.

There is a shortage of well-trained workers in the drafting industry. You are concerned with the problem, and so is education. The solution, therefore calls for the joint efforts of industry and education.

This survey offers you the opportunity for input into the training programs designed to prepare students for those jobs that actually exist.

The attached questionnaire is designed to gather the data specified in Item 1 above--to identify job titles existing in Architectural Drafting. Your response is crucial because you are the only source for this information. It is not found in a textbook.

Before you lay this letter aside, please take a few minutes out of your busy schedule to complete the survey sheets and return them in the enclosed, stamped, and addressed envelope.

Very truly yours,

B. R. West

Robert E. Drehobl

Dr. B. R. West, Project Director
Indiana V'TECS Coordinator

Robert E. Drehobl, Project Coordinator
North Lawrence Area Vocational-Technical Center
Bedford, Indiana

slw

Enclosures

SURVEY TO DETERMINE JOB TITLES

IN ARCHITECTURAL DRAFTING

I. Write your Name: _____

Your Job Title: _____

Company Name: _____

Address: _____

_____

Phone: _____

II. Indicate the type of activity your company is involved in (check all those that are appropriate).

- ☐ Architectural
- ☐ General Contractor
- Consulting Engineer
  - ☐ Civil
  - ☐ Structural
  - ☐ Electrical
  - ☐ Mechanical
- ☐ Fabricator-Building Materials
- Pre-Fabricated Structures
  - ☐ Mobile Homes
  - ☐ Pre-Engineered Steel Buildings
  - ☐ Modular Buildings
- ☐ Vendor
- ☐ Other (please specify) _____

_____

III. Write the total number of workers employed by your company that are involved in architectural drafting.

☐ TOTAL EMPLOYEES *

*This figure should equal the number of total employees in Column 2 on page 4.

INSTRUCTIONS

A. Examine the sample survey form attached and note the column headings. They are:

Column 1: Job Titles. List job titles assigned to the drafting employees in your organization.

Column 2: Number of Employees. List the number of employees in your organization who have job titles in Columns 3 through 39.

Columns 3-39: These columns identify the areas of responsibility in which each job title may be classified. Indicate the percentage of time the incumbent spends doing tasks in each area. Columns listed "Other" are provided for you to list areas of responsibility which we have not included. Please use them freely.

B. Look at the sample survey form on the following page. The firm employs:

** 3 General Construction Drafters. This is their job title. They spend 90% of their time preparing floor plans, 5% of their time preparing exterior elevations, and 5% of their time preparing interior elevations.

** 2 Structural Drafters. This is their job title. They spend 80% of their time preparing structural steel framing drawings and 20% of their time preparing schedules.

** 1 Mechanical Drafter. This job title holder spends 30% of their time preparing ductwork drawings, 55% of their time preparing plumbing diagrams, and 15% of their time drawing sprinkler systems.

** 1 Electrical Drafting Supervisor. This job title holder spends 10% of his time assigning work, 80% of his time coordinating projects, and 10% of his time working with electrical plans.

C. On the survey form on page 4 list the job titles of your workers and classify them by indicating the percentage of working time they spend in each of the appropriate columns.

D. Total Column 2. The total of this column should equal the Total Employees in Block III on the first page.

E. Place the completed questionnaire in the enclosed, stamped, and addressed envelope and mail it. Thank you for your time and assistance.

Example

Example

ARCHITECTURAL DRAFTING CATEGORIES

Column (1)	(2)	General Construction (3)–(12)										Structural (13)–(21)									Mechanical (22)–(28)								Electrical (29)–(34)							Civil (35)–(39)					
															Framing							Plumbing				HVAC															
JOB TITLE	Number of Drafters	Floor Plans	Sections	Exterior Elevations	Interior Elevations	Door	Window	Room Finish	Stair Detail	Misc. Detail	Other	Footers/ Foundations	Wood	Steel	Concrete	Floor Systems	Roof Framing	Misc. Iron	Schedules	Other	Schematics	Diagrams	Sprinkler Systems	Other	Ductwork	Mechanical Equipment	Other	Lighting	Electrical Plans	Riser Diagrams	Other (designing work)	Other (coordinating Project)	Drainage	Utilities	Site Work	Paving	Landscape	Other
General Construction Drafter	3	90%		5%	5%																																		
Structural Drafter	2													80%					20%																				
Mechanical Drafter	1																					55%	15%		30%															
Electrical Drafting Supv.	1																											10%		10%	80%								
TOTAL EMPLOYEES	7*																																						

* This figure should equal the number of Total Employees in Block III on page 1.

Example

ARCHITECTURAL DRAFTING CATEGORIES

Column (1)	(2)	General Construction										Structural									Mechanical							Electrical						Civil					
															Framing							Plumbing					HVAC												
JOB TITLE	Number of Drafters	Floor Plans	Sections	Exterior Elevations	Interior Elevations	Door	Window	Room Finish	Stair Detail	Misc. Detail	Other	Footers/ Foundations	Wood	Steel	Concrete	Floor Systems	Roof Framing	Misc. Iron	Schedules	Other	Schematics	Diagrams	Sprinkler Systems	Other	Ductwork	Mechanical Equipment	Other	Lighting	Electrical Plans	Riser Diagrams	Other	Other	Drainage	Utilities	Site Work	Paving	Landscape	Other
TOTAL EMPLOYEES	*																																					

* This figure should equal the number of Total Employees in Block III on page 1.

INDIANA
V-TECS

E & T Bldg., Room 1107 799 W. Michigan St. Indianapolis, Indiana 46202 Phone (317) 264-2277

TO:: Architects/Engineers or Drafting Supervisors

Enclosed is a revised page one of the recent survey we sent to you. Notice we have changed "Butler" Buildings to "Pre-Engineered Steel Buildings." On the original document we referred to "Butler" Buildings as a type of business activity. We were aware that Butler is a brand name; but in our desire to communicate to you the "kind" of building to which we were referring, we used the word Butler generically.

We realize that this is wrong and could cause some concern. We apologize if we have offended anyone and are substituting "Pre-Engineered Steel Buildings" as the activity to which we are referring.

Please don't let this mess-up on our part prevent your responding to the survey. The goal is still industry-education cooperation in the training of a more competent work force.

Very truly yours,

Dr. B. R. West, Project Director
Indiana V'TECS Coordinator

Robert E. Drehobl, Project Coordinator
North Lawrence Area Vocational-Technical Center
Bedford, Indiana

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Enclosure

APPENDIX B

Job Title Matrices

AG. SALES AND SERVICE PROGRAM MATRIX

CURRICULA	COURSE	JOB TITLES	TASKS	COURSE CORE	CURRICULA CORE	PROGRAM CORE
Production Supplies	Livestock Handling Equipment	Livestock Yard Worker Mixer Person Nurse Truck Driver	List of Tasks For Each Job Title	Tasks and L.C.* Common to Livestock Handling Equipment	Tasks and Learning Content Common to Production Supplies Curricula	Tasks and Learning Content Common to Ag. Sales and Service Program
	Crop Storage and Handling	Construction & Equipment Employee Construction Supervisor Elevator & Feed Mill Manager Grain Elevator Operator Grain Handler Laborer Repair Shop Worker Salesperson Truck Driver	List of Tasks For Each Job Title	Tasks and Learning Content Common to Crop Storage and Handling Course		
	Fertilizer/ Chemicals	Branch Manager Crop Guide Manager Crop & Store Foreman Delivery Person Fertilizer & Chemical Applicator Fertilizer Plant Operator Fieldman General Manager Loader/Mixer Location Manager Maintenance Worker Mix Plant Operator Nurse Truck Operator Pilot Applicator Plant Food & Chemical Worker Plant Manager Salesperson Sales Manager Shop Foreman Spreader Operator Truck Driver Warehouse Worker	List of Tasks For Each Job Title	Tasks and Learning Content Common to Fertilizer/ Chemicals Course		

*L.C.-- Learning Content

AG. SALES AND SERVICE PROGRAM MATRIX

CURRICULA	COURSE	JOB TITLES	TASKS	COURSE CORE	CURRICULA CORE	PROGRAM CORE
Production Supplies	Seed	Grain Buyer Manager (Seed) Production Workers Sales Manager Seedhouse Manager Seed Salesperson Warehouse Manager	List of Tasks For Each Job Title	Tasks and Learning Content Common to Seed Course	Tasks and Learning Content Common to Production Supplies Curricula	Tasks and Learning Content Common to Ag. Sales and Service Program
	Feed	Elevator Manager Elevator Worker Feed Mill Manager Feed Mill Worker Feed Salesperson Feed Specialist Truck Driver/Delivery Person	List of Tasks For Each Job Title	Tasks and Learning Content Common to Feed Course		
Product Marketing	Crops	Branch Manager Conditioning Seed Worker Elevator Manager Elevator Worker Farm Manager Feed Mill Worker Fertilizer Employee Grain Buyer Grain Manager Grain Marketing Grain Superintendent Manager Plant Superintendent Production Manager Salesperson Truck Driver	List of Tasks For Each Job Title	Tasks and Learning Content Common to Crops Course	Tasks and Learning Content Common to Product Marketing Curricula	
	Livestock	General Laborer/Livestock Livestock Production Manager Manager Sales Manager Salesperson Truck Driver	List of Tasks For Each Job Title	Tasks and Learning Content Common to Livestock Course		

PRINTING PROGRAM MATRIX

CURRICULA	COURSE	JOB TITLES	TASKS	COURSE CORE	CURRICULA CORE	PROGRAM CORE
Gravure	Layout Composition (Typesetting) Make-up Plate Making Press Operation Finish (Bindery)	At the time of the data analysis, there were no job incumbents reported in any of these areas.				Tasks and Learning Content Common to Printing Program
Offset	Layout	Cameraman Estimator Layout Man Paste-up Man Production Man Proofreader Salesman Stripper Typesetter	List of Tasks For Each Job Title	Tasks and Learning Content Common to Layout Course	Tasks and Learning Content Common to Offset Curricula	
	Composition (Typesetting)	Cameraman Keyboard Operator Machine Monitor Preparation Man Typesetter	List of Tasks For Each Job Title	Tasks and Learning Content Common to Composition (Typesetting) Course		
	Make-up	Cameraman Copy Processor Film Library General Manager Job Coordinator Paste-up Man Photo Setter Preparation Foreman Stripper	List of Tasks For Each Job Title	Tasks and Learning Content Common to Make-up Course		
	Plate Making	Cameraman Job Coordinator Press Operator-Offset Proofreader Stripper	List of Tasks For Each Job Title	Tasks and Learning Content Common to Plate Making Course		
	Press Operation	Cameraman Feeder Folder Operator Packer Press Foreman	List of Tasks For Each Job Title	Tasks and Learning Content Common to Press Operation Course		

PRINTING PROGRAM MATRIX

CURRICULA	COURSE	JOB TITLES	TASKS	COURSE CORE	CURRICULA CORE	PROGRAM CORE
Offset	Press Operation	Press Operator-Offset Stationery Store Clerk Unit Press Operator Web/Offset Pressman	List of Tasks For Each Job Title	Tasks and Learning Content Common to Press Operation Course	Tasks and Learning Content Common to Offset Curricula	Tasks and Learning Content Common to Printing Program
	Finish (Bindery)	Bindery Operator Bookbinder Coater Operator Collator Operator Cutter Die Maker Distribution (Mail Room) Feeder Mail Room Helper Packer Press Foreman Press Operator-Offset Shipping Clerk	List of Tasks For Each Job Title	Tasks and Learning Content Common to Finish (Bindery) Course		
Letterpress	Layout	Hand Compositor Layout Man	List of Tasks For Each Job Title	Tasks & Learning Content Common to Layout Course	Tasks and Learning Content Common to Letterpress Curricula	
	Composition (Typesetting)	Layout Man Press Operator-Letterpress Printer Proofreader Typesetter	List of Tasks For Each Job Title	Tasks & Learning Content Common to Composition (Typesetting) Course		
	Make-up	Press Operator-Letterpress Printer	List of Tasks For Each Job Title	Tasks & Learning Content Common to Make-up Course		
	Plate Making	Platemaker Press Operator-Letterpress	List of Tasks For Each Job Title	Tasks & Learning Content Common to Plate Making		
	Press Operation	Checker Press Operator-Letterpress	List of Tasks For Each Job Title	Tasks & Learning Content Common to Press Operation		
	Finish (Bindery)	Bindery Operator	List of Tasks For Each Job Title	Tasks & Learning Content Common to Finish (Bindery)		
Management/ Supervision	Purchasing	Estimator Foreman General Manager Office Manager	List of Tasks For Each Job Title	Tasks & Learning Content Common to Purchasing Course	Tasks & Learning Content Common to Mgmt./Supervision Curricula	

PRINTING PROGRAM MATRIX

CURRICULA	COURSE	JOB TITLES	TASKS	COURSE CORE	CURRICULA CORE	PROGRAM CORE
Management/ Supervision	Purchasing	Owner Production Manager Publisher Purchasing Agent Supervisor	List of Tasks For Each Job Title	Tasks and Learning Content Common to Purchasing Course	Tasks and Learning Content Common to Management/ Supervision Curricula	Tasks and Learning Content Common to Printing Program
	Sales	Estimator General Manager Office Manager Owner Production Manager Publisher Salesman Salesman/Layout Supervisor	List of Tasks For Each Job Title	Tasks and Learning Content Common to Sales Course		
	Scheduling	Estimator Foreman General Manager Office Manager Owner Production Manager Publisher Scheduler Supervisor	List of Tasks For Each Job Title	Tasks and Learning Content Common to Scheduling Course		
	Supervision	Advertising Manager Estimator Expeditor Foreman General Manager Office Manager Owner Production Manager Publisher Sales/Manager Supervisor	List of Tasks For Each Job Title	Tasks and Learning Content Common to Supervision Course		
	Quality Control	Customer Service Rep. Foreman General Manager Owner Production Manager Publisher Quality Controller Supervisor	List of Tasks For Each Job Title	Tasks and Learning Content Common to Quality Control Course		

WELDING PROGRAM MATRIX

CURRICULA	COURSE	JOB TITLES	TASKS	COURSE CORE	CURRICULA CORE	PROGRAM CORE
Electric Welding	SMAW	Boilermaker Welder Certified Pipe Welder Certified Production Welder Electron Beam Welder Field Fabrication Welder Fitter Jig and Fixture Welder Maintenance Welder On-Site Erector Production Layout Person Sheet Metal Welder SMAW Welder Structural Fabricator Tool and Die Welder	List of Tasks For Each Job Title	Tasks and Learning Content Common to SMAW Course	Tasks and Learning Content Common to Electric Welding Curricula	Tasks and Learning Content Common to Welding Program
	GTAW	Automatic Tig Machine Operator Certified Production Welder Fitter Production Layout Person Tig Welder Tool and Die Welder	List of Tasks For Each Job Title	Tasks and Learning Content Common to GTAW Course		
	GMAW	Automatic Mig Machine Operator Certified Pipe Welder Certified Production Welder Field Fabricator Welder Fitter Hard Coater Jig and Fixture Welder Mig Welder Sheet Metal Welder Tool and Die Welder	List of Tasks For Each Job Title	Tasks and Learning Content Common to GMAW Course		

WELDING PROGRAM MATRIX

CURRICULA	COURSE	JOB TITLES	TASKS	COURSE CORE	CURRICULA CORE	PROGRAM CORE
Electric Welding	SAW	Certified Production Welder Production Layout Person Sub Arc Operator	List of Tasks For Each Job Title	Tasks and Learning Content Common to SAW Course	Tasks and Learning Content Common to Electric Welding Curricula	Tasks and Learning Content Common to Welding Program
		Certified Production Welder Production Layout Person Sheet Metal Welder Spot Welder	List of Tasks For Each Job Title	Tasks and Learning Content Common to		
Oxyfuel Welding and Metal Preparation and Separation	Oxyfuel Welding (Gas)	Casing Welder Maintenance Welder Oxyfuel Welder Tool and Die Welder	List of Tasks For Each Job Title	Tasks and Learning Content Common to Oxyfuel Welding (Gas) Course	Tasks and Learning Content Common to Oxyfuel Welding and Metal Preparation and Separation Curricula	
	Oxyfuel Brazing	Soldering Machine Operator Tubing Brazer	List of Tasks For Each Job Title	Tasks and L.C.* Common to Oxyfuel Brazing Course		
	Metal Preparation and Separation	Burner Carbon Arc Operator Fitter Track Burner	List of Tasks For Each Job Title	Tasks & Learning Content Common to Metal Preparation & Separation Course		

*L.C.--Learning Content

BUILDING TRADES MATRIX

CURRICULA	COURSE	JOB TITLES	TASKS	COURSE CORE	CURRICULA CORE	PROGRAM CORE
Rough Carpentry	Foundations	General Helper Laborer			Tasks and Learning Content Common to Rough Carpentry Curricula	Tasks and Learning Content Common to Residential Building Trades Program
	Framing and Exterior Trim	Boxer Carpenter Carpenter Helper Construction Superintendent Erection Crew Member Foreman Form Builder Carpenter Frame Carpenter General Helper Grounds Worker Laborer New Construction Carpenter Remodeling Carpenter Roofer Rough Carpenter Rough Framer Sider	Task Inventories Available For Each Job Title	Tasks and Learning Content Common to Course		
	Roofer	Carpenter Helper General Helper Roofer		Common to Each		
Masonry	Brick	Brick Layer Hod Carrier Laborer Mason			Tasks and Learning Content Common to Masonry Curricula	
	Cement Block	Laborer Mason				
Concrete	Foundations and Walls	Concrete Finisher Laborer Mason			Tasks and Learning Content Common to Concrete Curricula	
	Flatwork	Carpenter Carpenter Helper Concrete Finisher Laborer				
Finish Carpentry	Interior Finishing	Carpenter Carpenter Helper Construction Superintendent Finish Carpenter Floor Installer Footing Man General Contractor			Tasks and Learning Content Common to Finish Carpentry Curricula	

BUILDING TRADES MATRIX

CURRICULA	COURSE	JOB TITLES	TASKS	COURSE CORE	CURRICULA CORE	PROGRAM CORE
Finish Carpentry	Interior Finishing	General Helper Handy Man Head Carpenter Interior Finisher Trim Carpenter	Task	Tasks	Tasks and Learning Content Common to Finish Carpentry Curricula	Tasks
	Cabinetry	Cabinet Maker Carpenter Construction Superintendent General Helper	Inventories	and		and
Insulation	Blown & Batts	Insulator		Learning	Tasks and L.C. Common to Insulation Curr.	
Wall and Ceiling Finishing	Drywall	Drywall Hanger	Available		Tasks and Learning Content Common to Wall and Ceiling Finishing Curr.	Learning
	Plaster and Stucco	Plaster Worker	For	Content		Content
Heating, Ventilating and Air Conditioning	Air Conditioning	Electrician Heating Worker		Common	Tasks and Learning Content Common to Heating, Ventilating & Air Conditioning Curricula	Common
	Heating	Heating & Air Cond. Worker Heat Installer Heating Worker	Each			
	Ductwork	Heating & Air Cond. Worker Heating Worker	Job	to		to
Plumbing	Plumbing	Foreman Laborer Plumber Plumber/Electrician	Title	Each	Tasks & L.C. Common to Plumbing Curricula	Residential
Floor Covering	Carpet	Carpet Layer Concrete Slab Worker Floor Covering Worker Floor Installer Handy Man		Course	Tasks & L.C. Common to Floor Covering Curricula	Building
Wall Finish	Paper	Painter			Tasks and Learning Content Common to Wall Finish Curricula	Trades
	Paint	Interior Decorator Laborer Painter				
						Program

BUILDING TRADES MATRIX

CURRICULA	COURSE	JOB TITLES	TASKS	COURSE CORE	CURRICULA CORE	PROGRAM CORE
Ceramic	Wall	Ceramic Installer	Task Inventories Available For Each Job Title	Tasks and Learning Content Common to Each Course	Tasks and Learning Content Common to Ceramic Curricula	Tasks and Learning Content Common to Residential Building Trades Program
	Floor	Ceramic Installer				
Site Preparation	Grading and Excavating	Excavator			Tasks and Learning Content Common to Site Preparation Curricula	
		Laborer				
	Septic, Water and Sewer	Excavator				
	Well	Well Digger				